

**REMARKS**

The Office Action dated September 6, 2005, has been received and reviewed.

Claims 1-25 are currently pending and under consideration in the above-referenced application. Each of claims 1-25 stands rejected.

Reconsideration of the above-referenced application is respectfully requested.

**Rejections under 35 U.S.C. § 102**

Claims 1-11 and 15-19 stand rejected under 35 U.S.C. § 102(b).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

With respect to inherency, M.P.E.P. § 2112 provides:

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) . . . ‘To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill . . .’ *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1991).

**Hudson**

Claims 1-11 and 15-19 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 5,972,792 to Hudson (hereinafter “Hudson”). It is noted that Hudson issued on October 26, 1999, and the above-referenced claims the benefit of priority to the filing date of U.S. Application Serial No. 09/651,808, filed August 30, 2000, now U.S. Patent 6,602,117, issued on August 5, 2003. As Hudson did not issue (*i.e.*, was not published) more than one year before the priority date of

the above-referenced application, Hudson does not qualify as prior art under 35 U.S.C. § 102(b). Rather, it could only qualify as prior art to the above-referenced application under 35 U.S.C. § 102(a).

Independent claim 1 recites a slurry for use in polishing a copper structure of a semiconductor device, the slurry being substantially free of abrasives and formulated to substantially concurrently polish copper and a barrier material with the barrier material being removed at substantially the same rate as or at a slower rate than copper is removed.

Regarding claim 1, it was asserted in the Office Action that since Hudson uses a composition that is substantially free of abrasives as recited in claim 1, then using Hudson's slurry in the same manner as claimed in the present invention would inherently result in the slurry being formulated to substantially concurrently polish copper and a barrier material with the barrier material being removed at substantially the same rate as or at a slower rate than copper is removed. Office Action mailed September 6, 2005, page 3.

It is respectfully submitted that, under 35 U.S.C. § 102(a), independent claim 1 recites subject matter which is allowable over that described in Hudson. Hudson discloses abrasive-free slurries that are useful with fixed-abrasive polishing pads for planarizing copper. Col. 3, lines 29-30; col. 4, lines 50-52.

Hudson does not expressly or inherently describe a slurry that is useful for polishing copper and a barrier material "with the barrier material being removed at substantially the same rate or at a slower rate than copper is removed," as would be required to anticipate each and every element of independent claim 1.

With respect to slurries that are formulated to remove multiple materials, or a "multi-level film stack," the description of Hudson is limited to a simple explanation that some or all of the levels of the stack may be oxidized (col. 4, lines 20-28) without etching or otherwise dissolving any of the levels of the stack or materials at the surface of a substrate that is to be polished (col. 5, line 55, to col. 6, line 2). Hudson provides no express description that a barrier material may be removed at substantially the same rate as or at a slower rate than copper is removed.

Moreover, none of the slurries disclosed in Hudson necessarily removes a barrier at substantially the same rate as or at a slower rate than copper is removed. In fact, Hudson lacks any mention of a slurry that is formulated to remove both copper and a copper barrier.

As Hudson does not expressly or inherently describe each and every element of independent claim 1, under 35 U.S.C. § 102(a), the subject matter recited in independent claim 1 is allowable over the subject matter described in Hudson.

Each of claims 2-11 and 15-19 is allowable, among other reasons, for depending either directly or indirectly from independent claim 1, which is allowable.

Claim 3 is additionally allowable since Hudson neither expressly nor inherently describes a slurry that is formulated to oxidize copper at substantially the same rate as or at a faster rate than a barrier material is oxidized.

Claim 4 is further allowable because Hudson does not expressly or inherently describe a slurry in which copper and a barrier material have substantially the same oxidation energies.

Claim 5 depends from claim 4 and is also allowable since Hudson includes no express or inherent description of a slurry in which a barrier material has an oxidation energy of about 0.25 V more to about 0.20 V less than an oxidation energy of copper.

Claim 6 is further allowable since Hudson lacks any express or inherent description of a slurry in which a rate of removal of a barrier material is up to about ten times slower than a rate of removal of copper.

Claim 7 is additionally allowable because Hudson includes no express or inherent description of a slurry in which a rate of removal of a barrier material is about two to about four times slower than a rate of removal of copper.

Claim 8 is also allowable since Hudson neither expressly nor inherently describes a slurry that is formulated to remove copper and a barrier material without substantially dissolving barrier material that underlies remaining portions of copper.

For these reasons, withdrawal of the 35 U.S.C. § 102(a) rejections of claims 1-11 and 15-19 is respectfully solicited.

**Rejections under 35 U.S.C. § 103(a)**

Claims 12-14 and 20-25 stand rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

M.P.E.P. § 2143.01 provides that “if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.”

M.P.E.P. § 2143.01 further provides that “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”

Hudson in View of Nakazato

Claims 12-14 and 21-25 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over that taught in Hudson as applied to claim 1 above, and further in view of teachings from U.S. Patent 4,459,216 to Nakazato *et al.* (hereinafter “Nakazato”).

Claims 12-14 and 21-25 are each allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Moreover, it is respectfully submitted that there is no suggestion or motivation for one of ordinary skill in the art to have combined or modified teachings from Hudson and Nakazato in

the asserted manner, as required to establish a *prima facie* case of obviousness against claims 12-14 and 21-25.

Hudson, at col. 4, lines 1-19, and col. 5, lines 55-64, teaches against dissolving conductive material while polishing the same. Nakazato teaches that “[a]n object of the present invention is to provide a chemical dissolving solution having a good dissolving capacity for various kinds of metal.” Col. 2, lines 33-35. If the dissolving solution of Hudson were modified by the teachings of Hudson, the resulting slurry would be formulated to dissolve conductive materials and, according to Hudson, modify the slurry of Hudson unsatisfactory for its intended purpose (*i.e.*, to oxidize without dissolving).

Moreover, a slurry that is formulated to avoid dissolution of conductive material is a principle of operation of Hudson that would be changed by incorporating teachings of Nakazato, which are directed to a solution that dissolves conductive material, into a slurry according to Hudson.

Therefore, one of ordinary skill in the art wouldn’t have been motivated to combine teachings from Hudson and Nakazato. Thus, a *prima facie* case of obviousness of claims 12-14 and 21-25 under 35 U.S.C. § 103(a) has not been established, and each of these claims is allowable.

#### Nakazato in View of Okinaka

Claim 20 stands rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over that taught in Nakazato as applied to claim 1, and further in view of teachings from U.S. Patent 4,349,411 to Okinaka (hereinafter “Okinaka”).

This rejection is not fully understood, as Nakazoto was never applied to claim 1.

In any event, claim 20 is allowable, among other reasons, for depending indirectly from claim 1, which is allowable.

Therefore, withdrawal of the 35 U.S.C. § 103(a) rejections of claims 12-14 and 20-25 is respectfully requested.

**CONCLUSION**

It is respectfully submitted that each of claims 1-25 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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